Flood Management & Site Servicing for Planning Proposal

10 Victoria Street, Berry NSW 2535

REPORT

PREPARED FOR
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Ref: 167385-CR03
Rev: C
Date: 11.12.19

PLANNING PROPOSAL

Activity Schedule

Date	Revision	Issue	Prepared By	Approved By
02.12.19	A	Issued for Information	P.Rung	P.Cornish
05.12.19	B	Issued for Information	P.Rung	P.Cornish
11.12.19	C	Issued for Information	P.Rung	P.Cornish

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1. INTRODUCTION

Northrop Consulting Engineers has been commissioned by Mbark Pty Ltd to provide preliminary advices for the proposed development to a portion of 10 Victoria Street, Berry NSW (Lot 6 DP1204186).

The proposed development, located within 10 Victoria Street, Berry NSW, is within the Shoalhaven City Council Local Government Area (LGA). The proposed development (the site) is located to the northeast of the current retirement village along the northern and eastern lot boundary. The site is approximately 0.77 hectares and is bound by Victoria Street to the north, a retirement village to the east, Pepper Farm Drive to the west and remaining Lot 6 land to the south. Works proposed include the construction of ten (10) single lots and one public road. This will include new connection of services including sewer, water, electricity, telecommunication, and stormwater drainage network.

The purpose of this report is to;

- Identify the location, size and capacity of all existing services within the vicinity of the subject site;
- Identify any upgrade works and options to connect to existing services and infrastructure to secure supply of services to the proposed development;
- Identify risks and engineering challenges associated with the proposed development and outline recommendations.

1.1 Site Topography

The existing site is predominantly grassland surrounded by trees. Contour information provided in site survey by Johnson Procter Surveyors for the subject site area indicates the site falls toward the southwest from a maximum RL of approximately 12.6m AHD at the northeast corner to a minimum RL of approximately 7.0m AHD at the southwest corner. No existing buildings are located on site.

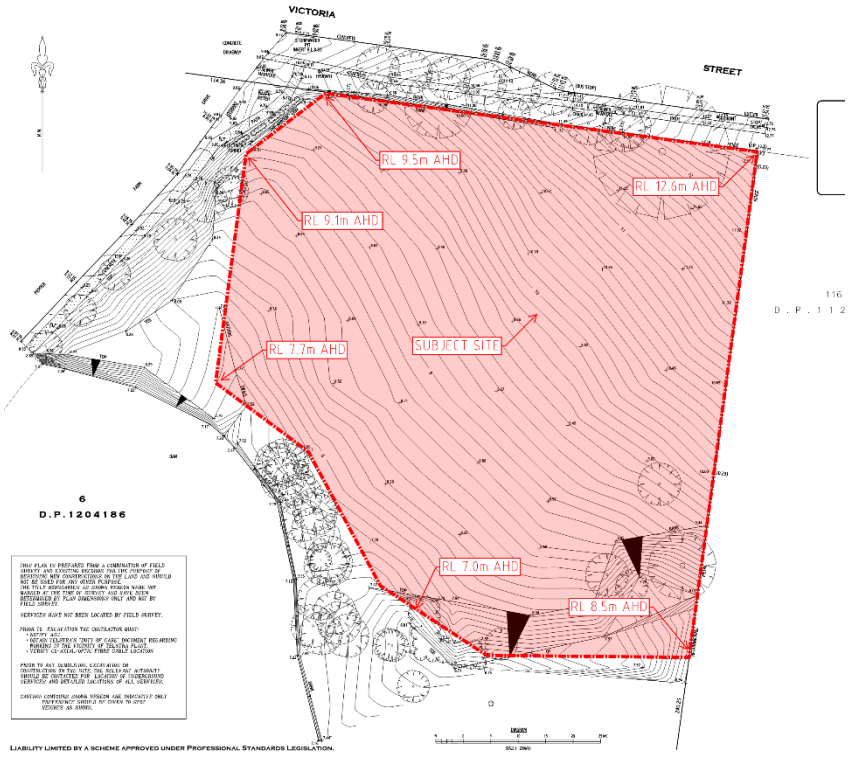


Figure 1. Existing Site Topography.

1.2 Limitations and Exclusions

Due care and skill have been exercised in the preparation of this report.

No responsibility or liability to any third party is accepted for any loss or damage arising out of the use of this report by any third party. Any third party wishing to act upon any material contained in this report should first contact Northrop for detailed advice which will take into account that party's particular requirements.

Our findings are based on the following:

- Review of Dial Before you Dig (DBYD) information requested on 30th November 2018. This identified the following services and asset owners within the vicinity of the site:
    - Endeavour Energy
    - NBN
    - Shoalhaven Council's Water Utility
    - Telstra
- The calculations found in this report are based on the conceptual plans provided by the client dated 19.11.2019, refer **Appendix A**.

1.3 Approvals

- Northrop has submitted an application for new power connection to Endeavour Energy for further advices and approval. Other applications to authorities in references to services connections have not been submitted.
- No liaison with the local fire brigade has been sought.

2. FLOODING

A flood certificate has been previously issued by Shoalhaven City Council dated 11th December 2018, stating that Lot 6 DP1204186 is affected by the 1% AEP flood event. As such, flood planning measurements must be carried out in accordance with Shoalhaven City Council DCP Chapter G9: Development on Flood Prone Land. Post to issuing the flood certificate, a flood hazard category map and flood levels at specific locations have been provided by Council's flood engineer Tanvir Ahmed.

Council's flood hazard category map identifies the proposed development is situated largely outside hazard areas. **Appendix F** illustrates the proposed development's location on the aforementioned map. A small portion of five lots along the southern extent are encroaching the "low hazard floodway" and "low hazard flood storage" zones. Furthermore, **Appendix F** demonstrate a small portion of three lots along the south west extent of the proposed development are encroaching the "high hazard floodway" and "high hazard flood storage" zones. However, an email from Council's flood engineer (Tanvir Ahmed, dated 26.02.2019) has confirmed that "any type of encroaching to high hazard floodway is not recommended by Council except the isolated ones".

Shoalhaven City Council's Development Control Plan (DCP) provides design guidelines and solutions for flood prone land. The proposed development has been assessed with these requirements and shows that it is generally complaint and can be serviced by the existing infrastructure.

2.1 Flood Planning Levels

As per the requirements specified in the pre-DA meeting (and Shoalhaven City Council DCP Chapter G9), the finished floor level of the proposed development must be set above the PMF flood levels or 1% AEP +0.5m freeboard, whichever is higher. The following measures may be adopted to achieve Council's FPL requirements:

- Maintain existing natural surface levels for areas located outside of flood hazard category map;
- Propose filling of land for areas encroaching the low hazard floodway and low hazard flood storage areas.

2.2 Flood Management General Controls

Shoalhaven City Council DCP Chapter G9 have developed general performance criteria for developments on flood prone land to minimize flood impacts and risks to life and properties as below:

Table 2-1: Flood Management Controls.

Performance Criteria	Design Solution
• **The development will not increase the risk to life or safety of persons during a flood event on the development site and adjoining land;** • **The development or work will not unduly restrict the flow behaviour of floodwaters;** • **The development or work will not unduly increase the level or flow of floodwaters or stormwater runoff on land in the vicinity;** • **The development or work will not exacerbate the adverse consequences of**	The extent of the proposed development will be located outside of the high hazard flood area, except minor overlap with a 'high hazard flood' area isolated from the main high hazard floodway at the southern end of the proposed road. Confirmation has been sought from Council's flood engineer Tanvir Ahmed, suggesting that 'any type of encroaching to high hazard floodway is not recommended by the Council except the isolated one'. Southern area encroaching the rest of the 'low hazard floodway' and 'low hazard flood storage' zones is only minor. Therefore, it is not expected to result in any adverse impact on floodwater characteristics.

floodwaters flowing on the land with regard to erosion, siltation and destruction of vegetation; • **Interaction of flooding from all possible sources has been taken into account in assessing the proposed development against risks to life and property resulting from any adverse hydraulic impacts;** • **The development will not adversely affect the integrity of floodplains and floodways, including riparian vegetation, fluvial geomorphologic environmental processes and water quality.**	Excavation may be carried out to compensate the loss of flood storage volume due to filling on site in future detailed design. A hydraulic impact assessment may be prepared upon Council's request to determine any possible impacts to floodwater and adjacent/downstream properties resulted by the proposed development in future detailed design.
• **The structural characteristics of any building or work that are the subject of the application are capable of withstanding flooding in accordance with the requirements of the Council;** • **The development will not become unsafe during floods or result in moving debris that potentially threatens the safety of people or the integrity of structures;** • **Potential damage due to inundation of proposed buildings and structures is minimised.**	Setting the finished floor levels of the proposed development above the PMF levels or 1% AEP + 0.5m, whichever is higher, will prevent any damages or impacts caused by floodwater to the building's components or structural soundness.
• **The development will not obstruct escape routes for both people and stock in the event of a flood;** • **The development will not unduly increase dependency on emergency services.**	An emergency evacuation strategy must be prepared in future detailed design which may incorporate the following strategies: • Shelter in place • Appropriate evacuation route

3. EXISTING SERVICES INFRASTRUCTURE

3.1 Existing Sewer Infrastructure

DBYD plans and existing services plans have identified existing sewer main and private pressure sewer line in the vicinity of the site as below:

- A Council sewer main along Victoria Street at the northeast corner of the site, owned and maintained by Shoalhaven Water;

3.2 Existing Water Infrastructure

DBYD plans and existing services plans have identified existing water main and private water and fire service lines in the vicinity of the site as below:

- A Council water main along Victoria Street at the northern boundary of the site, owned and maintained by Shoalhaven Water;

3.3 Existing Stormwater Infrastructure

Inspection of the existing site condition identifies a stormwater pit situated along Victoria Street at the northern boundary of the site.

3.4 Existing Gas Infrastructure

Preliminary services investigations have identified that there is no availability of gas in the vicinity of the site.

3.5 Existing Electrical Infrastructure

DBYD plans have identified existing power supply network and substations in the vicinity of the site:

- Electrical cables along the length of Victoria Street, owned and maintained by Endeavour Energy;
- Overground pillar on Victoria Street at the northwest corner of the site, owned and maintained by Endeavour Energy;
- Padmount substation located within the adjacent property Lot 1008 DP1107175, approximately 70m from the site;
- Padmount substation located to the south of current retirement village, approximately 400m from the site.

3.6 Existing Telecommunication Infrastructure

DBYD plans have identified existing Telstra and NBN networks in the vicinity of the site:

- NBN and Telstra conduits and pits along Victoria Street owned and maintained by relevant service authorities.

4. PROPOSED SERVICES INFRASTRUCTURE

4.1 Proposed Sewer Infrastructure

The proposed point of connection from the site to Shoalhaven City Council's gravity sewer main is located in Victoria Street via the existing sewer manhole, located to the north of the proposed development.

Preliminary sewage generation rates have been estimated in the table below in accordance with the Sewerage Code of Australia - Sydney Water Edition, WSA-02-2002 (2009).

Table 4-1: Sewerage Generation Rates

Sewer Drainage		
No. of Lots	**EP/Lot**	**EP**
10	3.5	35

Preliminary advice from Council is that the current capacity in Council's sewer main would be adequate to serve the additional 10 lots from this proposed development, however final confirmation will be subject to the Shoalhaven Water Notice conditions issued by Shoalhaven Water.

To make connection at this location, lead-in sewer lines have been proposed to service the 4 lots directly adjacent to Victoria Street. A sewer pump has been proposed to service the remainder of the lots. This proposal is subject to the invert level of the sewer asset.

Refer **Appendix B** for preliminary sewer servicing concept.

4.2 Proposed Water Infrastructure

Water supply options for the proposed development include:

- Connecting to existing water main in Victoria Street

  There is an existing water main running along Victoria Street south. The proposed development can be serviced by connecting into Shoalhaven Council's water main in Victoria Street.

Preliminary advice from Council is that the current capacity in Council main would be adequate to serve the additional 10 lots from this proposed development, however final confirmation will be subject to the Shoalhaven Water Notice conditions issued by Shoalhaven Water.

Refer **Appendix C** for preliminary water servicing concept.

4.3 Proposed Stormwater Infrastructure

The site's stormwater system comprises of a series of inter-allotment drainage and pits. The stormwater shall be collected and treated in a water quality chamber; after which it will be discharged into the existing riparian zone using a headwall and flow dissipators.

Additionally, each lot will require on-site detention tanks (private assets) in order to maintain predeveloped flows from the site.

Refer **Appendix D** for stormwater servicing concept.

4.4 Proposed Electrical Infrastructure

The proposed point of connection for the site is from the HV cables in Victoria Street. Preliminary power demand has been estimated in table below based on the 'Technical Bulletin 0188A – Changes to MDI0030 ADMD Schedule' issued by Endeavour Energy.

Table 4-2: Power Demand Calculation.

Description	ADMD (kVA)/Lot	Load (A/Phase)
10x Dwellings - Urban	6.5	104
Street Lighting	Allow for 30% Load	32
Total		136

The proposed connection will be subject to approval from Endeavour Energy assuming there is sufficient capacity in the pad-mount substation located to the east within Lot 1008 DP1107175.

A new substation will be required to supply power to this development if Endeavour Energy determines the current electrical infrastructure in Victoria and in the adjacent Lot 1008 DP1107175 to be under capacity.

4.5 Proposed Telecommunications Infrastructure

The NBN line shall be serviced from one of two NBN pits from Victoria Street. Application to provide proposed NBN pit and pipe networks in accordance with NBN-TE-CTO-284 shall be submitted to relevant service authorities for approval. The lines shall run directly from the front of the properties facing Victoria Street. The interior properties within the cul-de-sac shall be serviced by a separate line that will run along the proposed road.

Refer **Appendix E** for preliminary telecommunications servicing concept.

5. CONCLUSION

A summary of conducted assessments and recommendations for the proposed development is listed below:

- Sewer Drainage Services

Infrastructure around the site appears to be sufficient, however a sewer pump is required to fully service the site. Final confirmation will be subject to Shoalhaven Water Notice conditions.

- Potable Water Services

Infrastructure within Victoria Street appears to be sufficient. Final confirmation will be subject to Shoalhaven Water Notice conditions.

- Stormwater Services

Infrastructure within Victoria Street appears to be sufficient. Final confirmation will be subject to Shoalhaven Water Notice conditions.

- Natural Gas Services

No gas services are available in the vicinity of the site.

- Electrical Services

An application for connection to Endeavour Energy will be submitted to confirm current infrastructure capacity and seek new connection approval.

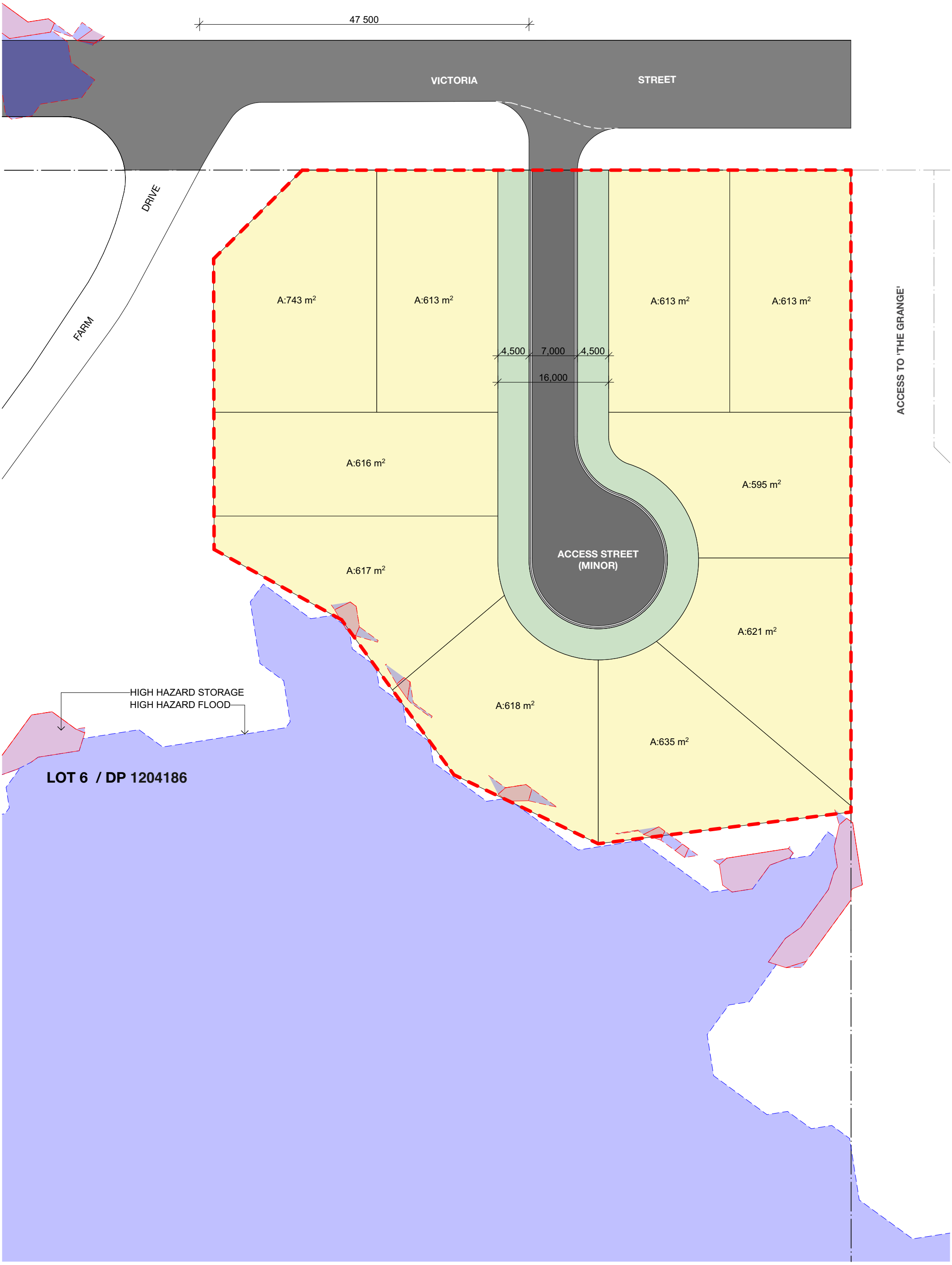
Substation will be required to supply power to this development if Endeavour Energy determines the current power infrastructure in Victoria and within adjacent Lot 1008 DP1107175 to be under capacity.

- Telecommunication Services

Telstra and NBN infrastructures are present adjacent to the site, therefore connection to the existing infrastructure is available. Design of the network will be requested from the relevant provider for the installation of pits and conduit networks.

The proposed services infrastructure outlined in this report and the suitability of proposed connections to sewer, water, natural gas, electrical and telecommunications infrastructure) will be subject to specific / detailed applications with the respective Authorities, at relevant / subsequent phases of the project.

APPENDIX A – ARCHITECTURAL PLAN



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NOMINATED ARCHITECT: NICOLAS KARL RICHTER
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Member Australian Institute of Architects

NSW Architects Registration Board

DESIGNER
CERTIFIED PASSIVE HOUSE DESIGNER

NOTE
Notify any errors, discrepancies or omissions to the architect. Refer to written dimensions only. Do not scale drawings. Drawings shall not be used for construction purposes until issued for construction.

N

SCALE: 1:500
PRINT SIZE: A3
PRINT DATE: 19/11/19

PROJECT NO.
19051

CLIENT: MBARK PTY LTD

SITE: 10 VICTORIA STREET, BERRY

DRAWING TITLE :
SITE PLAN

PROJECT NAME :
THE ARBOUR PP

ISSUE:
PP

DRAWING NO.
100:02

REVISION NO.
A

APPENDIX B – SEWER SERVICING CONCEPT

SHOALHAVEN WATER SEWER MAIN

PROPOSED CONNECTION POINTS TO EXISTING SEWER MAIN

PROPOSED SEWER MANHOLE FOR MAINTENANCE ACCESS (TYP)

PROPOSE TO DRAIN LOTS ADJACENT TO VICTORIA STREET TO EXISTING SEWER MANHOLE VIA NEW LEAD-INS.

PROPOSED SEWER PUMPING STATION FOR REAR LOTS (TYP)

PROPOSED DEVELOPMENT

PROPOSED SEWER END OF LINE MANHOLE FOR MAINTENANCE ACCESS

PROPOSED TO DRAIN REAR LOTS TO PUMPING STATION

FLOW DIRECTIONS FOR PROPOSED SEWER (TYP)

Overview

QUEEN ST

VICTORIA ST

PEPPERMINT DR

GEORGE ST

WINDSOR

180mm HDPE in 250mm MS sleeve

40mm HDPE

RISING MAIN No. 5 200mm MPVC

Headwall PS No. 5

80mm COPPER SERVICE & METER

100mm COPPER FIRE SERVICE

150mm DICL

100mm MPVC

250mm MPVC

195mm PVC

200mm

150mm

T.M. NO. 50

LOT 6 / DP 1204186

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DRAWING TITLE: APPENDIX B
SEWER SERVICING CONCEPT

JOB NUMBER: 167385-01

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APPENDIX C – WATER SERVICING CONCEPT

SHOALHAVEN WATER MAIN
- POSSIBLE CONNECTION POINT FOR WATER SUPPLY SUBJECT TO SHOALHAVEN WATER APPROVAL AND CURRENT LINE CAPACITY

PROPOSED TO CONNECT LOTS ADJACENT TO VICTORIA STREET TO EXISTING WATER MAINS VIA NEW LEAD-INS.

PROPOSED DEVELOPMENT

Overview

VICTORIA ST

WINDSOR DR

GEORGE ST

PEPPER FARM DR (PRIV)

RISING MAIN No. 5
200mm MPVC

Headwall
PS No. 5

80mm COPPER SERVICE & METER

100mm COPPER FIRE SERVICE

180mm HDPE

25mm HDPE

40mm HDPE

150mm DICL

100mm MPVC

100mm AC

250mm MPVC

195mm PVC

200mm

T.M. NO. 50

LOT 6 / DP 1204186

DH 1

DH 2

DH 3

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WATER SERVICING CONCEPT

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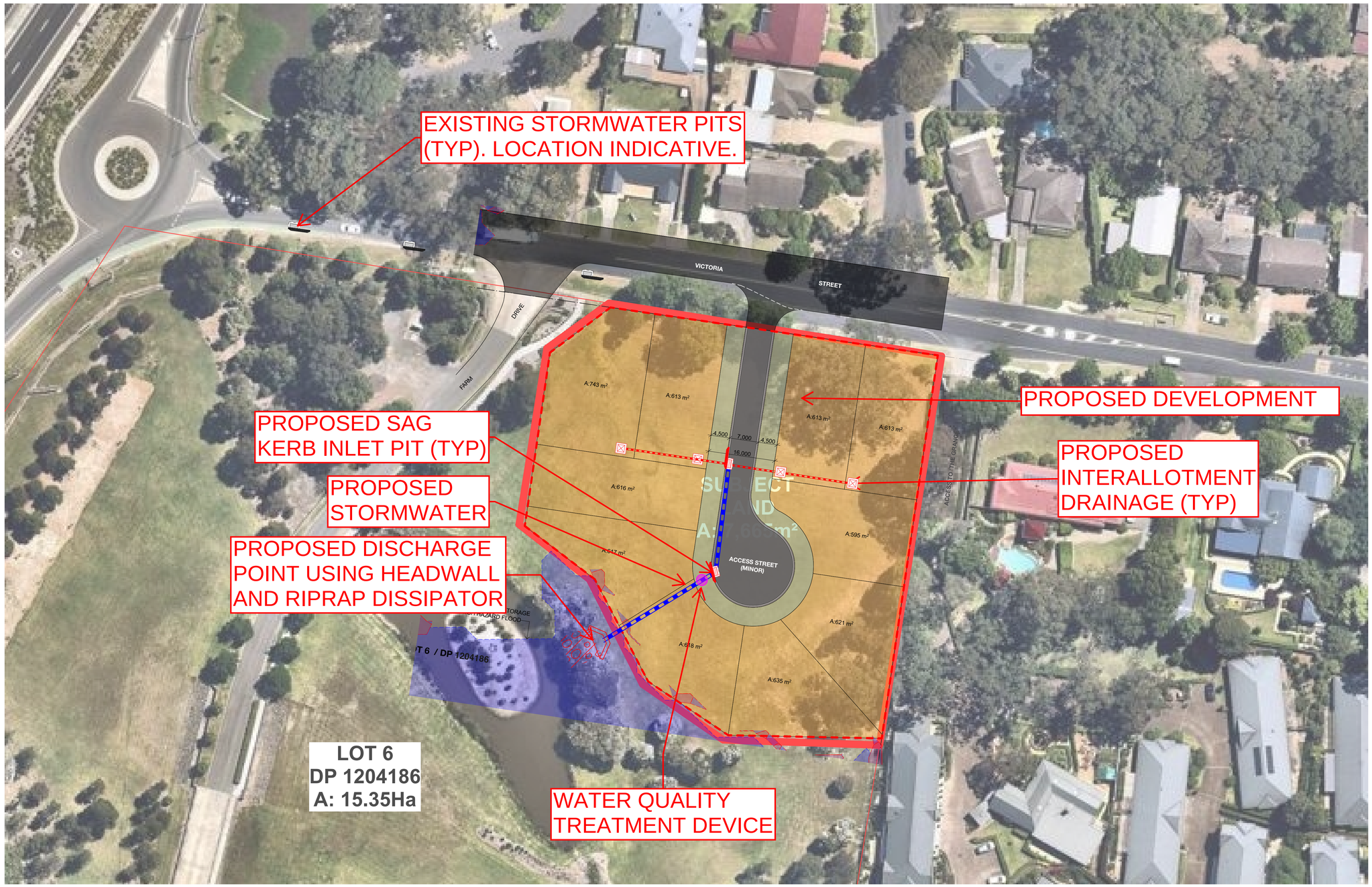
APPENDIX D – STORMWATER SERVICING CONCEPT



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DRAWING TITLE: APPENDIX D
STORMWATER SERVICING CONCEPT

JOB NUMBER: 167385-01

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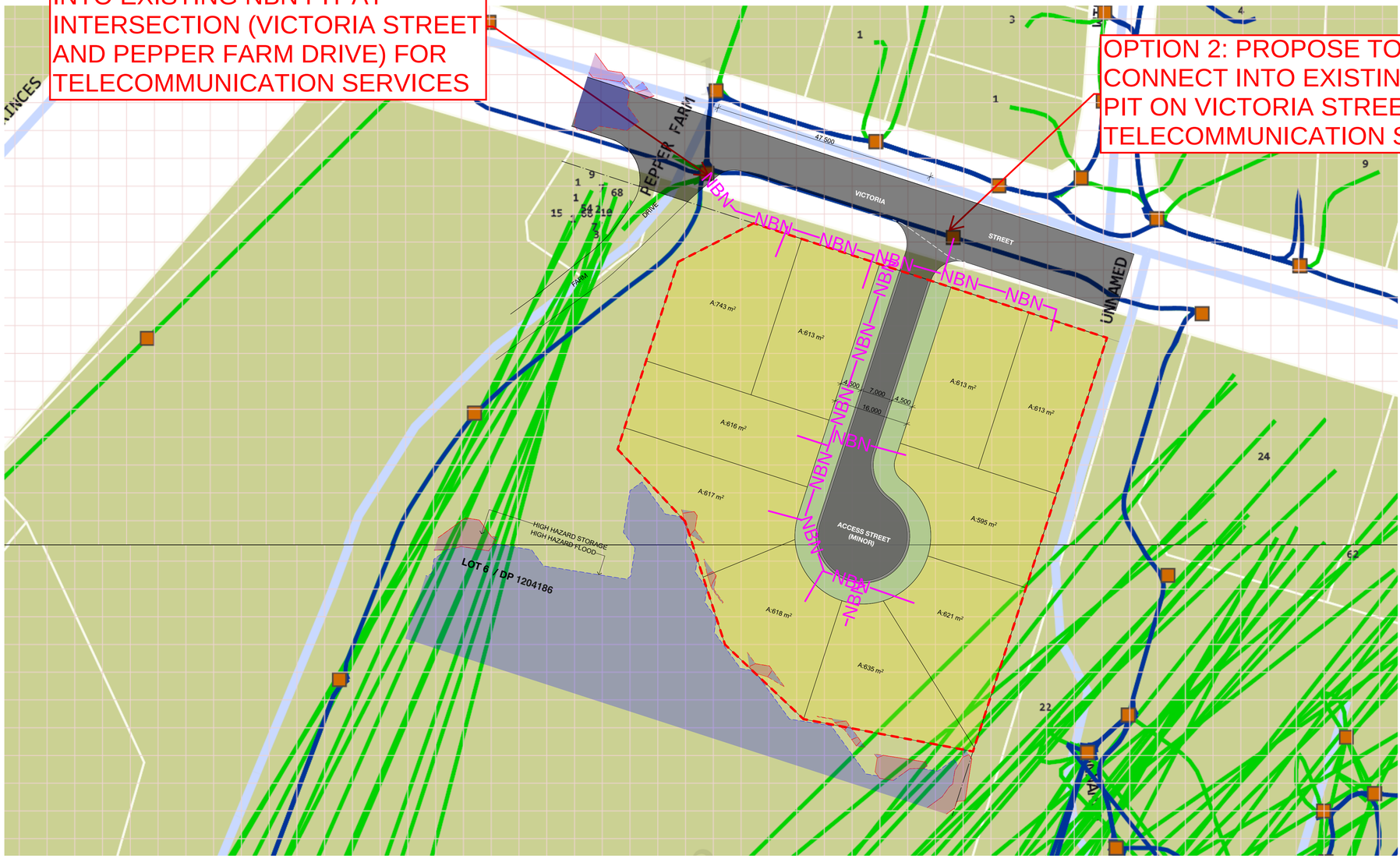
APPENDIX E – NBN SERVICING CONCEPT

OPTION 1: PROPOSE TO CONNECT INTO EXISTING NBN PIT AT INTERSECTION (VICTORIA STREET AND PEPPER FARM DRIVE) FOR TELECOMMUNICATION SERVICES

OPTION 2: PROPOSE TO CONNECT INTO EXISTING NBN PIT ON VICTORIA STREET FOR TELECOMMUNICATION SERVICES



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NBN SERVICING CONCEPT

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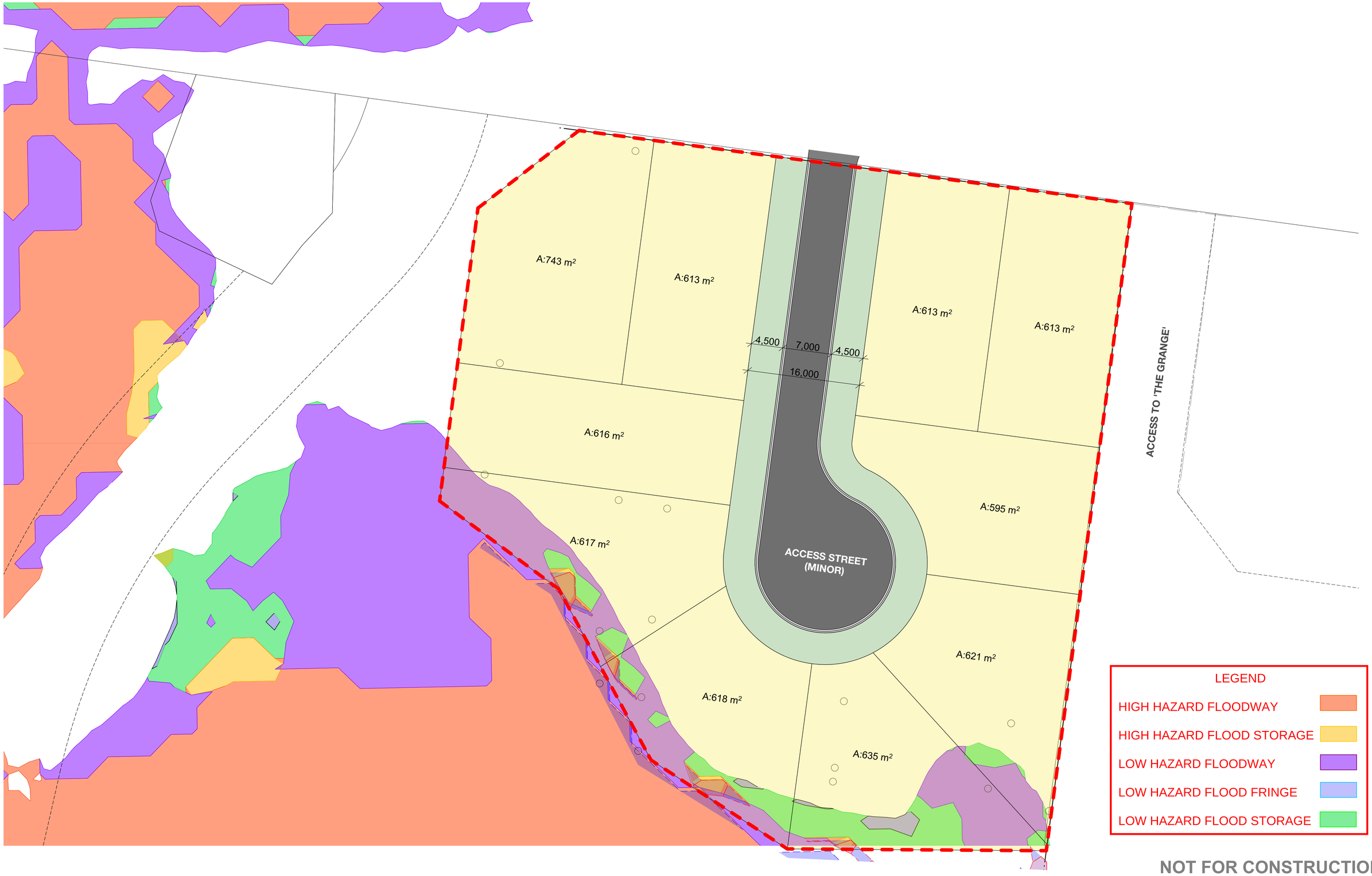
APPENDIX F – FLOOD HAZARD MAP



LEGEND

- HIGH HAZARD FLOODWAY
- HIGH HAZARD FLOOD STORAGE
- LOW HAZARD FLOODWAY
- LOW HAZARD FLOOD FRINGE
- LOW HAZARD FLOOD STORAGE

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FLOOD HAZARD MAP

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